NetBlazer® Version 2.2 Release Notes

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Introduction 1

Telebit is pleased to release Version 2.2 of the NetBlazer system software. Before attempting to configure and use the NetBlazer, please review this document. An overview of the new features and functions included in Version 2.2 is provided in Chapter 2, New Features/Changes.

NetBlazer release Version 2.2 is provided on three diskettes: the System diskette, which contains 14 files; the Utilites diskette, which contains10 files; and the Fixnvram diskette, which does not contain file-structured information. The following tables list the contents of the System and Utilities diskettes.

Table 1. System Diskette Contents

TELEBIT.SYS	BOOTP
FRED	ATK.LDR
IPX.LDR	SNMP.LDR
EDIT.LDR	TCL.LDR
TOKEN002.MCD	CHAT.TXT
MODEMCAP.TXT	DEFAULT.CNF
UPDATE.CNF	KRB.LDR

Table 2. Utilities Diskette Contents

PPPCFG.EXE	PPPCFG.HLP
PPPCFG.MDM	COMPPP.EXE
IPX.COM	WATCHPPP.EXE
MIB.TXT	MIB.CMU
ODIPPP.COM	NET.CFG

Your Comments or Questions

If you have any comments or questions about this release, send e-mail to **support@telebit.com**, or call Technical Support at **1-800-TELEBIT** or **408-734-5200**.

Telebit has also established an electronic mailing list for NetBlazer users to exchange NetBlazer-related questions and ideas; send e-mail to **netblazer-users@telebit.com**. If you want to be added to this list, send your request to **netblazer-users-request@telebit .com**.

NetBlazer Update Documentation

This release includes update sections to the existing 2.0 *NetBlazer Installation Manual*. These update sections are included in Chapter 4, Installation Manual Updates.

Future updates to the NetBlazer documentation will be available by using the FTP facility. New or updated pages to the documentation will be placed on the same server used for downloading software updates over the Internet. Since these pages are PostScript files, you need a PostScript printer to take advantage of this facility.

System Updates

If you are currently using an earlier version of the NetBlazer system software, you can use any of the methods described in Appendix B of the *NetBlazer Configuration Guide* to update your NetBlazer system software.

If you have any problems updating your system software, call Telebit's Technical Support at **1-800-TELEBIT** or **408-734-5200**.

New Features/Changes 2

This section overviews the new features and changes made to NetBlazer software from Version 2.1 to 2.2.

NetBlazer Version 2.2 Features

Support for New X.21 capable model of the dual port synchronous board

The NetBlazer 2.2 software supports a new model of the dual port synchronous card. The new synchronous card supports X.21 as well as RS-449, RS-530, V.35, and RS-232. Complete documentation for this card is provided in *Chapter 4, Installation Manual Updates*.

Support for a new version of the NE1 option board

The NetBlazer 2.2 software supports a new version of the NE1 option board. Complete documentation for this card is provided in *Chapter 4, Installation Manual Updates*.

AppleTalk ARA Performance Enhancements

In order to take full advantage of these ARA performance Enhancements, your Telebit modems must be upgraded to firmware level LA7.05 or above and the configuration changes in the System Update Procedure section of these release notes must be applied. Also see Table 2.1 in the Installation Manual Updates section of these Release Notes for further information.

Support for the NetBlazer Configuration Utility

See the *NetBlazer Graphical User Interface Installation/QuickStart Guide* for more information.

Version 2.1 Fixed Bugs

Netbits stomps on network routes with fewer bits

The netbits command has been removed; use "ip netmask" instead. See detailed description below.

Modems go BROKEN because they don't raise RI

Prior to this fix, the QBlazer and QBlazer Plus did not work well as an inbound call modem because these models do not provide Ring Indicator (pin 22).

PPP pool not assigning correct ip addresses

In Version 2.1, if the pool was too small (fewer addresses than lines), the NetBlazer might hand out a bad address or go into an infinite loop. There was no locking to prevent the same address from being used by two interfaces at the same time.

Need to make pooled PPP routes private

This can be done by adding the "private" option to the PPP "pool" command.

Usage: pool <interface> [<low-ip-addr>] [<count>] [private]

Send RIP when auto-route/arp interface is activated

If you are using auto-route, the route gets advertised immediately. In Version 2.1 there was as much as a 30-second delay.

User not deleted from list at logout

This is often referred to as the "phantom user" or "phantom process" problem.

RIP accept has been changed

By default, the NetBlazer accepts commands from any source. "ip rip accept <addr>" adds an address to a list of source addresses from which RIP will be accepted. If the "accept list" contains one or more entries, then RIP packets from addresses not on the list are ignored.

"ip rip refuse <addr>" works as it has all along: packets are accepted from any source not on the refuse list. Although it makes no sense to use "rip refuse" with "rip accept," this combination of commands is permitted to make it easier for customers to change versions of the NetBlazer code.

"rip norefuse <addr>" removes an address from the refuse list. This replaces the old "accept" command.

"rip noaccept <addr>" removes an address from the accept list. When all addresses have been removed from the accept list, the accept feature is disabled and the NetBlazer returns to its default behavior of accepting RIP packets from all sources (or all sources not on the refuse list, if entries on this list exist).

RIP listener enhancements

The interface netmask is now used by the rip server (listener) to add an implied netmask to routes learned from RIP packets. For each RIP destination, the NetBlazer first determines whether the address is part of a Class A, B, or C network; it then chooses the appropriate network mask (0xFF000000 for Class A, 0xFFFF0000 for Class B and 0xFFFFFF00 for Class C). This mask is then used to remove the host portion from the destination.

The network portion of the destination is compared to the network portion of each interface address. If there is a match, the subnetmask of the interface is used to determine the number of bits in the new effective mask. If no match is found, the mask derived from the Class A, B, or C rule is used as the effective mask

The complement of the effective mask is used to extract the host bits from the RIP destination. If the complement is not zero, the following rules are used. If the low-byte of the host bits is not zero, the number of network bits in the route is considered 32 (a host route). Otherwise if the next byte is not zero, the number of network bits is 24, otherwise if the next byte is not zero the number of network bits is 16. If the host part of the destination equals zero, the number of bits is derived from the effective mask (either the subnetmask from the first matching interface or the mask derived from the Class A, B, or C rule).

Caution: *Because the RIP listener now uses the interface netmask, you must ensure that the interface netmask commands in* ***startup.cnf*** *reflect the subnet mask(s) your organization is using. In versions of the NetBlazer prior to 2.2, the interface netmask was not used. Version 2.2's RIP listener may not work correctly with old* ***startup.cnf*** *files unless you update the netmask commands. If you wish IP RIP to ignore the interface netmask set it to the default values: Class A = 255.0.0.0, Class B = 255.255.0.0, Class C = 255.255.255.0.*

RIP netbits command obsolete

The "rip netbits" command is obsolete and should not be used. Its effect can be achieved with the "interface netmask" command. For example, if you were using "rip netbits 20" to tell RIP to use a subnetmask of 20, you should now use the command "interface netmask 255.255.240.0."

This solution is superior to "rip netbits" because the new RIP listener algorithm also allows the NetBlazer to correctly learn routes to Class A, B and C networks that are not part of the organization's network and should not have the 20-bit netmask applied to it.

New AppleTalk DDP checksum command

Prior to NetBlazer Version 2.2, many customers were unable to use QuickMail (by CE Software) or Microsoft Mail with the NetBlazer. This has been tracked down to a bug in some versions of the Macintosh AppleTalk ".ATP" driver. The bug causes the driver to compute DDP checksums incorrectly when a received packet is larger than the size of an expected ATP packet.

In Version 2.2, the NetBlazer default for DDP checksumming is off. If you need to turn DDP checksums on (at the risk of problems with some Applications like QuickMail and Microsoft Mail), issue the command: "configure appletalk interface checksum <if> on".

Additional Documentation

Correcting problems with Non-Volatile Memory

If a NetBlazer has become unusable because it was configured to use bootp with a very long timeout, and bootp is failing and cannot be made to work, the "FIXNVRAM" diskette can be used to "FIX" the NVRAM (non-volatile RAM). The NVRAM contains the information that tells the NetBlazer to use bootp, and how long to keep trying before booting the NetBlazer kernel (fred) from floppy diskette.

The FIXNVRAM diskette contains only a boot block that has the code necessary to zero the appropriate bytes of NVRAM that store the bootp information. It will give no indication that it has done anything, but after booting such a disk the NetBlazer should then boot the "fred" file from diskette, rather than booting the "bootp" file.

To reset the NetBlazers NVRAM follow these steps:

1. Insert "FIXNVRAM" diskette into the NetBlazer
2. Reboot (using the reset button or power cycling the NetBlazer)
3. Wait for the diskette light to come on and turn off again
4. Remove the "FIXNVRAM" diskette and insert the normal NetBlazer boot diskette back into the drive
5. Reboot (using the reset button or power cycling the NetBlazer)
6. The NetBlazer should boot from diskette again.

NetBlazer Modem Configuration and Call Completion Strategy

This section discusses solutions to the modem configuration problem. It then addresses simpler but related problems of returning a configured modem to a known state at the end of a call and what to do when the NetBlazer reboot command is issued.

Goals:

The NetBlazer's modem configuration system attempts to do two things:

- Automatically identify the type of modem, or if no modem is present, present a login prompt at 9600 bps.
- If a modem is found, configure the modem per the modem's description in **modemcap.txt**

Problems:

- Not all modems auto-baud. Few modems auto-baud to high DTE data rates (greater than 38400 bps).
- Some modems will not respond to commands when DTR is off.
- Modems do not always return a unique identification code
- In-bound calls can confuse the configuration process. Most modems mix the ring message ("RING" or "2") with other result codes. Some present the ring message in place of result codes, and some simply stop responding to the DTE. Setting S0 = 0 does not resolve these problems.
- Different modems are ready to respond to commands at different times. Some require waiting after DTR is lowered, others require waiting after DTR is raised. Some respond to commands quickly, others spend 10 or more milliseconds processing them.
- When a modem stops responding to DTE, the recovery procedure is often different for different modems. In some cases, the thing to do is to try other data rates, in other cases, the thing to do is toggle DTR and wait.
- When a modem is not available to accept an incoming call (because it is being configured, or because it is broken), it should not be selected from a hunt group.

In order to address these problems, the NetBlazer now makes the following values configurable.

Name	Default	Purpose
autostart-cmd	ATH1	Prevent in-bound calls during configuration
no-echo	ATE0V0	Modem sends responses, only
identify-cmd	ATI	Request identification code from modem
clarify-cmd	AT~I	Clarify ambiguous identification code
autodone-cmd	ATH0	Allow in-bound calls
autospeed	9600	DTE speed during configuration
autospeed-cmd	AT	Set or confirm DTE speed
dtr	On	State of DTR during configuration
dtr-on-pause	500	Milliseconds to pause after raising DTR.

The "clarify-cmd" is used only if the identification code is ambiguous. The default values for an ambiguous result are:

result-ambiguous 960, 965, 9600, 9650

The size of the result table is limited to 1,000 entries. If the result code is greater than 1,000, it is divided by 10 prior to table lookup.

There are two configuration sequences: Identify, Configure ("autoconfigure <line> on") and Configure ("autoconfigure <line> config"). The following strategies are recommended.

Identify, Configure

Part I: Identify

1. Lower DTR to reset the modem
2. Be sure DTR is on (unless custom modemcap says otherwise)
3. Pause (if dtr-on-pause is set)
4. Take the modem off-hook with ATH1
5. Identify the modem (if line autoconfigure is on)
6. Put the modem back on hook with ATH0

Part II: Configure

1. Pause (if dtr-on-pause is set)
2. Take the modem off-hook with ATH1
3. Configure the modem.
4. Put the modem back on hook with ATH0

Configure

1. Set autospeed (a "no-op" for most modems, but wblazer needs this)
2. Lower DTR to reset the modem
3. Make sure DTR is on (unless **modemcap** entry says otherwise)
4. Pause (if dtr-on-pause is set)
5. Set speaker volume (default ATM0, not important if it fails)
6. Command the modem to listen to DTE (e.g., ATH0H1, if it fails, reset, repeat up to 3 times, then continue the configuration process and hope for the best)
7. Configure the modem.
8. Adjust the modem to faster DTE speed (if necessary)
9. Allow the modem to take inbound calls (usually ATH0)

Note: *The Identify sequence has a failure window. If the Modem is thinking about an in-bound call during dtr-on-pause, it may not respond with the correct identification code. Once your NetBlazer configuration is stable, change from identify to configure by entering the command "auto <line> configure" for each line. If a call comes in during the Configure sequence prior to the ATH0H1 and causes the ATH0H1 command to fail, the NetBlazer will reset the modem and try again.*

Call Completion

There are two problems at call completion:

- The modem may not return to a state in which its DTE data rate matches the NetBlazer's
- While the NetBlazer is returning the modem to a known, matching state, an inbound call may cause this to fail.

The solution requires these steps:

1. Command the modem to listen to DTE (usually ATH0H1)
2. Set DTE speed if necessary
3. Confirm that the modem's DTE speed matches NetBlazer's
4. Allow the modem to take inbound calls (usually ATH0)

Selecting a line for dialout

The NetBlazer was sometimes selecting a line for use in dialing out even though the line did not have a powered on modem attached. Other times it would refuse to use a line that did. The test to see if a line is available is not configurable via the **modemcap** tags "idle-dsr" and "idle-cts." If either tag specifies "on," then the signal must be on for the line to be selected. For example "idle-dsr:on" means that DSR must be on for the line to be selected. If "idle-dsr:off" is specified, then an idle line with a modem is selected even if DSR is off. If no tag is specified, the default behavior is to require DSR on for AT modems and CTS on for V.25-bis.

System Update Procedure 3

Using diskcopy to Update Your System

To create a new working copy of the NetBlazer system diskette with your current system configuration using the **diskcopy** command, perform the following steps.

1. Start the NetBlazer using your current working copy of the NetBlazer system diskette, and log in as "root" or as some other user with system configuration privileges.
2. Format a new high-density diskette, and make a backup disk copy of the new system distribution diskette. Store the original NetBlazer system diskette in a safe place.
3. Save your current system configuration to your backup copy of the system diskette by entering a **configure save** command at the command prompt.
4. If you have customized your CHAT.TXT or MODEMCAP.TXT files, you will need to apply your modifications to the new files using a text editor on an MS-DOS system, or use FTP to transfer the files to a system with a text editor, modify the files and then transfer the files back to your NetBlazer using FTP.
5. Reboot your NetBlazer by entering a **reboot** command at the command prompt, and log in again as "root" or as some other user with system configuration privileges.
6. If you are updating from a version earlier than NetBlazer 2.0, enter **source update.cnf** at the command prompt to update your current configuration.
7. Save your current system configuration to the system diskette by entering a **configure save** command at the command prompt.

Note: *If you plan on using the NetBlazer Configuration Utility, please refer to Appendix C in the QuickStart Users Manuel*

AppleTalk ARA Performance Upgrade

Prior to Version 2.2, if the NetBlazer was used as an ARA server all the modem lines which could receive ARA calls had to be configured with dcdtime set to 4.0 seconds. This had the unfortunate effect of slowing down all logins to the NetBlazer, not just ARA calls.

Firmware version LA7.05 and later for the Telebit T3000 and WorldBlazer modems have new features to improve support when the NetBlazer is configured as an ARA server. If you have this new modem firmware the dcdtime work around is no longer necessary.

To configure the NetBlazer to take advantage of the new modem firmware capability, set the dcdtime on the T3000 and WorldBlazer lines to 0.320 using the command: **configure line dcdtime** <line> **0.320**

Installation Manual Updates 4

The update pages for your *NetBlazer Installation Manual* follow.

Replace pages 2-3 and 2-4 in the *NetBlazer PN Installation Guide* (part number 90271-01).

Replace pages 2-5 and 2-6 in the *NetBlazer ST Installation Guide* (part number 90226-01).

Replace pages 2-5 and 2-6 in the *NetBlazer 40 Installation Guide* (part number 90225-01).

Replace the following sections in the NetBlazer *Option Boards Installation Guide* (part number 90269-01):

- Table of Contents - Replace pages iii and iv.
- Chapter 1 - Replaces pages 1-1 through 1-8 with new pages 1-1 through 1-6.
- Chapter 3 - Replace pages 3-1 through 3-8.
- Appendix C - Replace pages C-1 through C-4 with new pages C-1 through C-6.

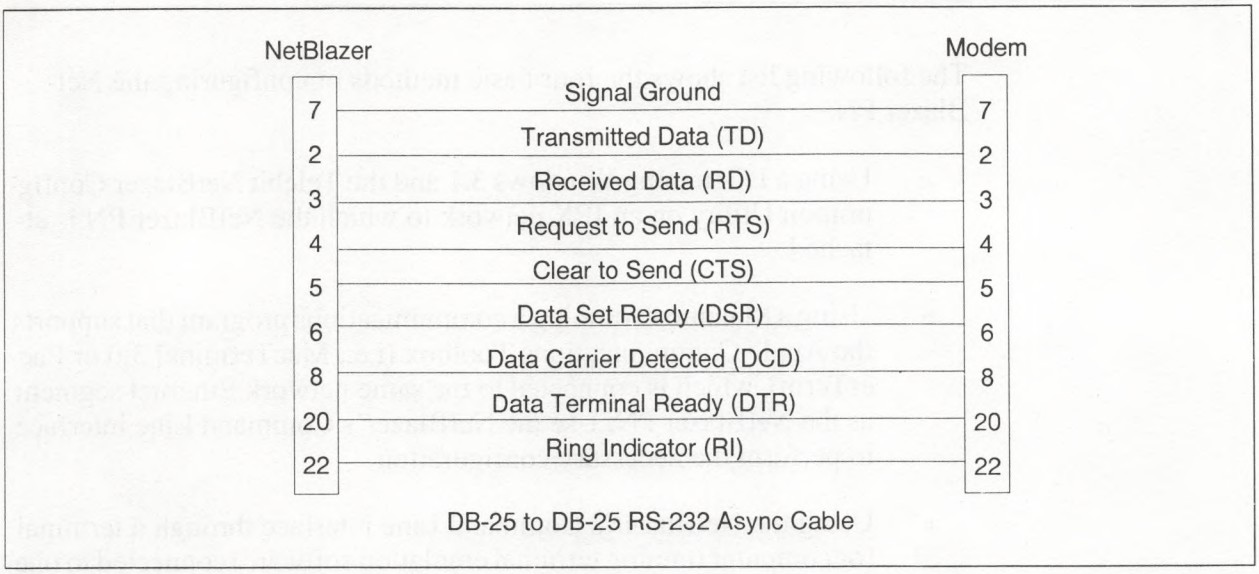

Figure 2-2. RS-232 Asynchronous Cable Configuration

The NetBlazer PN currently supports the external Telebit modems and firmware levels listed in Table 2-1.

Table 2-1. Supported Telebit Modems

Modem	Firmware Level	Firmware Level for AppleTalk ARA Service
QBlazer	MA1.01 or later	
QBlazer Plus	MA2.00 or later	
WorldBlazer SA or RM	LA5.00 or later	LA7.05 or later
T3000 SA or RM	LA5.00 or later	LA7.05 or later
T2500 SA or RM	GE6.01, GE7.00, GF7.00, or later	
T2000 SA or RM	BC5.00 or later	
T1600 SA	LA5.00 or later	LA7.05 or later
T1500 SA	GE6.01, GF7.00, or later	
T1000 SA	FA2.00 or later	
T1000 RM	FC2.00 or later	
TrailBlazer Plus SA or RM	BC7.00, GF7.00, or later	

If you have a Telebit modem that is not at the required firmware level, contact your Telebit Technical Support representative for information about getting a firmware upgrade.

The following list shows the four basic methods of configuring the NetBlazer PN:

- Using a PC running Windows 3.1 and the Telebit NetBlazer Configuration Utility on an IPX network to which the NetBlazer PN is attached
- Using a Macintosh running a communications program that supports the Apple Communications Toolbox (i.e., MacTerminal 3.0 or PacerTerm), which is connected to the same network Ethernet segment as the NetBlazer PN. Use the NetBlazer's Command Line interface to perform the necessary configuration
- Using the NetBlazer's Command Line interface through a terminal (or computer running terminal emulation software) connected to one of the NetBlazer's asynchronous ports
- Using a PC running DOS to directly edit the NetBlazer's STARTUP.CNF file to preconfigure the NetBlazer PN so that it can be reached from your network. Then log into the NetBlazer PN through a *telnet* (IP protocol only) session from any host on the network

Using the NetBlazer Configuration Utility

Telebit recommends that you use its NetBlazer Configuration Utility. This utility provides a menu-oriented user interface to the NetBlazer for fast and easy configuration over an IPX link.

Note: *The DOS PC used to run the NetBlazer Configuration Utility must be attached to the same Ethernet segment as the NetBlazer PN.*

Using the NetBlazer's AppleTalk Interface

The NetBlazer PN's factory defaults have the ADSP Server and AppleTalk protocol active on the Ethernet port. This enables you to perform NetBlazer PN configuration using a Macintosh running a communications software package such as MacTerminal or PacerTerm.

Using the NetBlazer's Command Line Interface

If you are unable to use the NetBlazer Configuration Utility or prefer the use the NetBlazer's command line interface, you need an administrator's workstation (at least temporarily) to configure the NetBlazer PN. This can be done using one of two approaches:

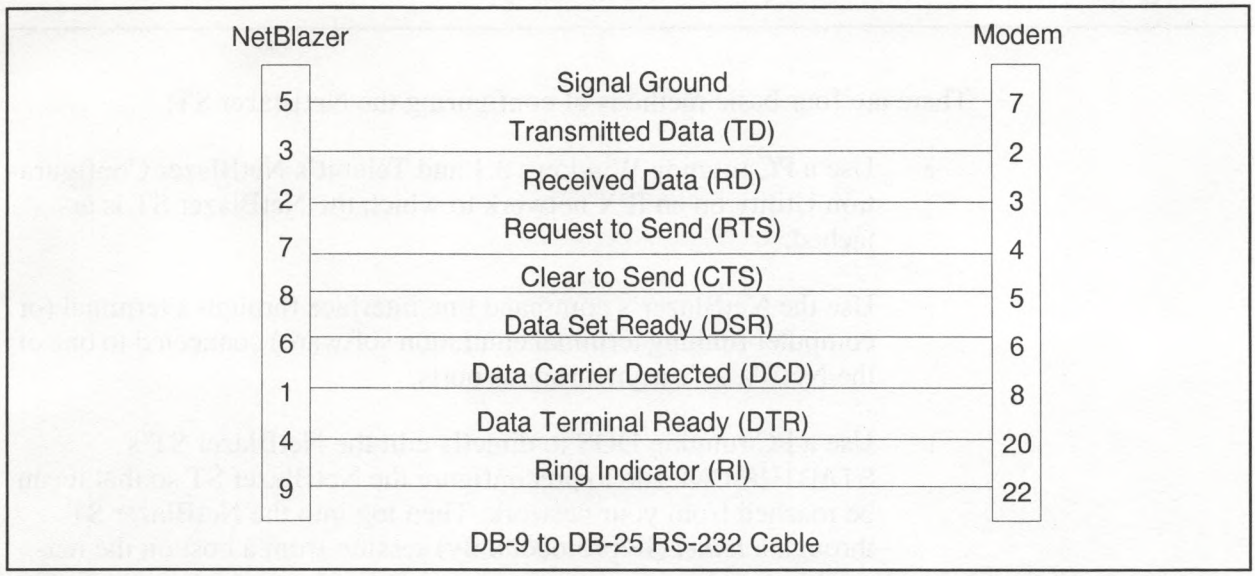

Figure 2-3. RS-232 Cable Configuration

Compatibility

The NetBlazer ST currently supports the Telebit modems and firmware levels listed in Table 2-1. If you have a Telebit modem that is not at the required firmware level, contact your Telebit Technical Support representative for information about getting a firmware upgrade.

Table 2-1. Supported Telebit Modems

Modem	Firmware Level	Firmware Level for AppleTalk ARA Service
QBlazer	MA1.01 or later	
QBlazer Plus	MA2.00 or later	
WorldBlazer SA or RM	LA5.00 or later	LA7.05 or later
T3000 SA or RM	LA5.00 or later	LA7.05 or later
T2500 SA or RM	GE6.01, GE7.00, GF7.00, or later	
T2000 SA or RM	BC5.00 or later	
T1600 SA	LA5.00 or later	LA7.05 or later
T1500 SA	GE6.01, GF7.00, or later	
T1000 SA	FA2.00 or later	
T1000 RM	FC2.00 or later	
TrailBlazer Plus SA or RM	BC7.00, GF7.00, or later	

There are four basic methods of configuring the NetBlazer ST:

- Use a PC running Windows 3.1 and Telebit's NetBlazer Configuration Utility on an IPX network to which the NetBlazer ST is attached;
- Use the NetBlazer's command line interface through a terminal (or computer running terminal emulation software) connected to one of the NetBlazer's asynchronous ports;
- Use a PC running DOS to directly edit the NetBlazer ST's STARTUP.CNF file to preconfigure the NetBlazer ST so that it can be reached from your network. Then log into the NetBlazer ST through a *telnet* (IP protocol only) session from a host on the network;
- Use a Macintosh running a communications program that supports the Apple Communications Toolbox (i.e., MacTerminal 3.0 or PacerTerm), which is connected to the same network Ethernet segment as the NetBlazer ST. Use the NetBlazer's command line interface to perform the necessary configuration.

Using the NetBlazer Configuration Utility

Telebit recommends that you use its NetBlazer Configuration Utility. This utility provides a graphics-oriented user interface to the NetBlazer ST for fast and easy configuration of IP and IPX protocols over an IPX link.

Note: *The DOS PC used to run the NetBlazer Configuration Utility must be attached to the same Ethernet segment as the NetBlazer ST.*

Using the NetBlazer's Command Line Interface

If you are unable to use the NetBlazer Configuration Utility or prefer the use the NetBlazer's command line interface, you need an administrator's workstation (at least temporarily) to configure the NetBlazer ST (see Figure 2-4). This can be done using one of two approaches:

- Connect a video display terminal or computer directly to the console port or any unused asynchronous port (use an RS-232 null modem cable).
- Connect an on-site workstation to a modem and telephone line to dial into the NetBlazer ST through the public switched telephone network (PSTN).

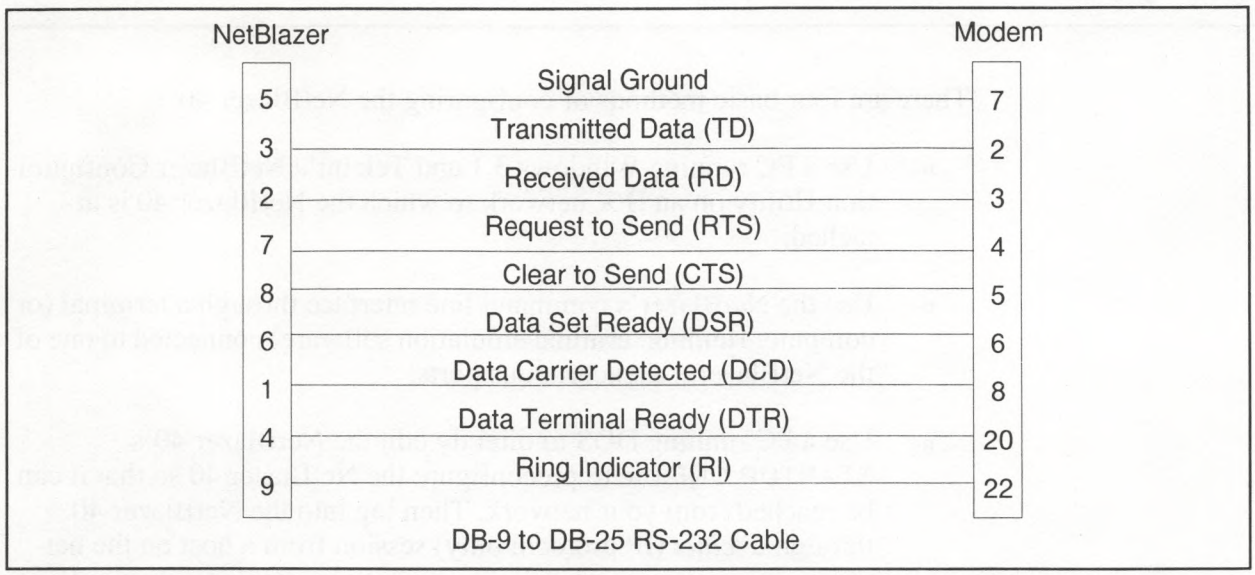

Figure 2-3. RS-232 Cable Configuration

Compatibility

The NetBlazer 40 currently supports the Telebit modems and firmware levels listed in Table 2-1. If you have a Telebit modem that is not at the required firmware level, contact your Telebit Technical Support representative for information about getting a firmware upgrade.

Table 2-1. Supported Telebit Modems

Modem	Firmware Level	Firmware Level for AppleTalk ARA Service
QBlazer	MA1.01 or later	
QBlazer Plus	MA2.00 or later	
WorldBlazer SA or RM	LA5.00 or later	LA7.05 or later
T3000 SA or RM	LA5.00 or later	LA7.05 or later
T2500 SA or RM	GE6.01, GE7.00, GF7.00, or later	
T2000 SA or RM	BC5.00 or later	
T1600 SA	LA5.00 or later	LA7.05 or later
T1500 SA	GE6.01, GF7.00, or later	
T1000 SA	FA2.00 or later	
T1000 RM	FC2.00 or later	
TrailBlazer Plus SA or RM	BC7.00, GF7.00, or later	

There are four basic methods of configuring the NetBlazer 40:

- Use a PC running Windows 3.1 and Telebit's NetBlazer Configuration Utility on an IPX network to which the NetBlazer 40 is attached;
- Use the NetBlazer's command line interface through a terminal (or computer running terminal emulation software) connected to one of the NetBlazer's asynchronous ports;
- Use a PC running DOS to directly edit the NetBlazer 40's STARTUP.CNF file to preconfigure the NetBlazer 40 so that it can be reached from your network. Then log into the NetBlazer 40 through a *telnet* (IP protocol only) session from a host on the network;
- Use a Macintosh running a communications program that supports the Apple Communications Toolbox (i.e., MacTerminal 3.0 or PacerTerm), which is connected to the same network Ethernet segment as the NetBlazer 40. Use the NetBlazer's command line interface to perform the necessary configuration.

Using the NetBlazer Configuration Utility

Telebit recommends the use of its NetBlazer Configuration Utility. This utility provides a graphics-oriented user interface to the NetBlazer 40 for fast and easy configuration of the IP and IPX protocols over an IPX link.

Note: *The DOS PC used to run the NetBlazer Configuration Utility must be attached to the same Ethernet segment as the NetBlazer 40.*

Using the NetBlazer 40's Command Line Interface

If you are unable to use the NetBlazer Configuration Utility or prefer the use the NetBlazer's command line interface, you need an administrator's workstation (at least temporarily) to configure the NetBlazer 40 (see Figure 2-4). This can be done using one of two approaches:

- Connect a video display terminal or computer directly to the console port or to any unused asynchronous port (use an RS-232 null modem cable).
- Connect an on-site workstation to a modem and telephone line to dial into the NetBlazer 40 through the public switched telephone network (PSTN).

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NE1 Ethernet Board Installation 1

This section provides instructions for installing the latest version of the NE1 Ethernet board in a NetBlazer. This board supersedes the previous NE1 board and provides enhanced configuration convenience and performance. For information on previous NetBlazer Ethernet boards, see Appendix C.

Note: *If you plan to boot the NetBlazer remotely from a bootp server, the NetBlazer's en0 interface must be on the same Ethernet segment as the bootp server, or as another NetBlazer configured for bootp forwarding. In the latter case, the second NetBlazer is used to forward bootp requests to the network bootp server. Refer to the Network Management section of the* NetBlazer Configuration Guide *for details.*

Factory Default Option Settings

As shipped from the factory, the NE1 Ethernet board is preset to a I/O Base Address of 240h. This may need to be reset according to your system requirements.

Open the NetBlazer Case

Make sure that the NetBlazer is not connected to an AC power outlet, then open the NetBlazer case by performing the following steps.

1. Using a Phillips-head screwdriver, remove the screws on rear or sides of the NetBlazer top cover as shown in Figure 3-1 of the Installation Guide for your NetBlazer ST or 40.
2. Slide the top cover back and lift the top cover off the NetBlazer.

Media Type

This NE1 board, in conjunction with NetBlazer release 2.2, features automatic media-type selection. When you turn on the power to the NetBlazer, the hardware automatically detects a connection to the unshielded twisted pair (UTP) connector. If you use the AUI or BNC connector, the software puts the Ethernet controller in "promiscuous" mode and polls the AUI and BNC connectors to see which one receives a packet. You do not have to remove the board and change a jumper to change media type.

You can change the automatic selection between AUI and BNC with the following command:

configure ethernet [<interface>] [bnc|aui|poll]

The interface can be either en0, en1, or en2. The option bnc selects the BNC connector, aui selects the AUI connector, and poll makes the NetBlazer carry out the automatic selection process.

The information learned by polling is not saved in the STARTUP.CNF file. Saving this information would prevent the NetBlazer from automatically recognizing that it had moved from one media type to another and rebooted. You can override the automatic selection feature at boot time by adding the **ethernet** command to the END.CNF file. (For information on the END.CNF file, see the **files** command in the *NetBlazer Command Reference Manual.*)

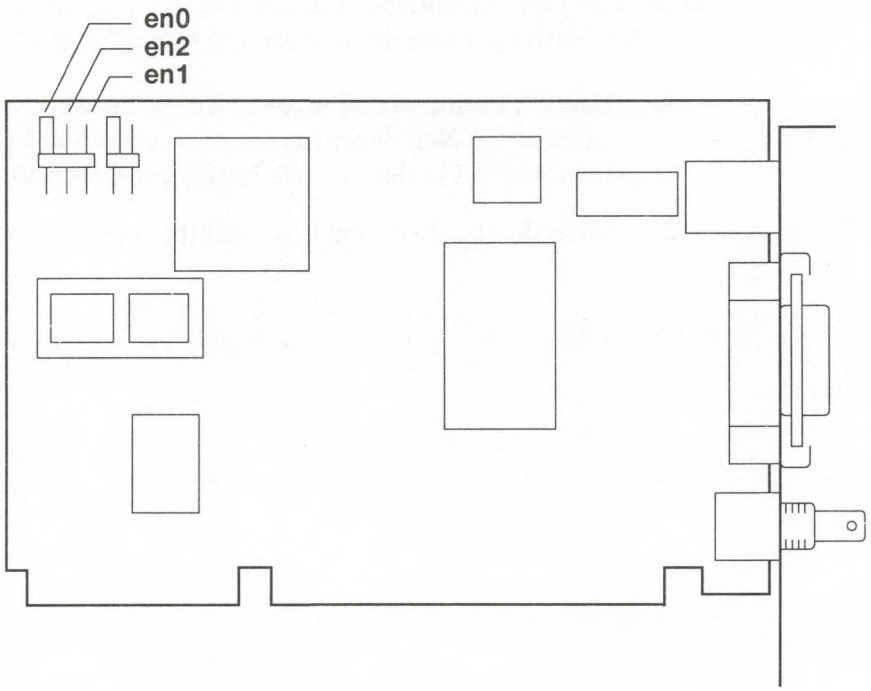


Figure 1-1: NE1 Address Jumper Locations

When configuring a NetBlazer containing multiple Ethernet boards, or mixed Ethernet and Token Ring boards, be sure to set the appropriate IRQs and Base I/O addresses correctly.

Refer to Figure 1-1 and Table 1-1 for the setting appropriate to your installation.

Table 1-1. Ethernet Board I/O Address Assignments

Ethernet Board	Label	Port
en0	SOFT	240
en1	300	300
en2	280	280h

Installing or Replacing the Ethernet Board

After setting the Base I/O Address, install (or reinstall) the Ethernet board. Carefully guide the board into its slot (as shown in the installation guide for your NetBlazer ST or 40), so that the board's edge connector is aligned with the slot connector and the AUI/BNC connectors extend through the slot opening. Then, firmly press on the top edge of the board until it is securely mated with its connector. Replace the Ethernet board mounting screw.

Note: *The latest version of the NE1 board has no LED cable connector. Ethernet status LEDs are mounted on the board.*

Closing the NetBlazer Case

Close the NetBlazer case (see Chapter 3 in the Installation Guide for your NetBlazer ST or 40). Connect the AC power cord supplied with your NetBlazer to the power-cord connector on the back of the NetBlazer and to an AC outlet.

Connecting the Ethernet Board to the LAN

Note: *The figures in this guide show the Ethernet board in the vertical (NetBlazer 40) position. In the NetBlazer ST, the board is in the horizontal position.*

Connecting to a Thin Ethernet (10Base-2) Network

To connect the Ethernet board to a thin Ethernet cable using a T connector as shown in Figure 1-2, follow these steps:

1. Attach the thin Ethernet cable to both ends of a T connector. If the NetBlazer is the last device on the cable, attach a 50-ohm terminator to one end of the connector. Neither side of the T connector should be left open.
2. Plug the T connector into the BNC connector on the Ethernet board. Turn the T connector sleeve clockwise to lock in place.

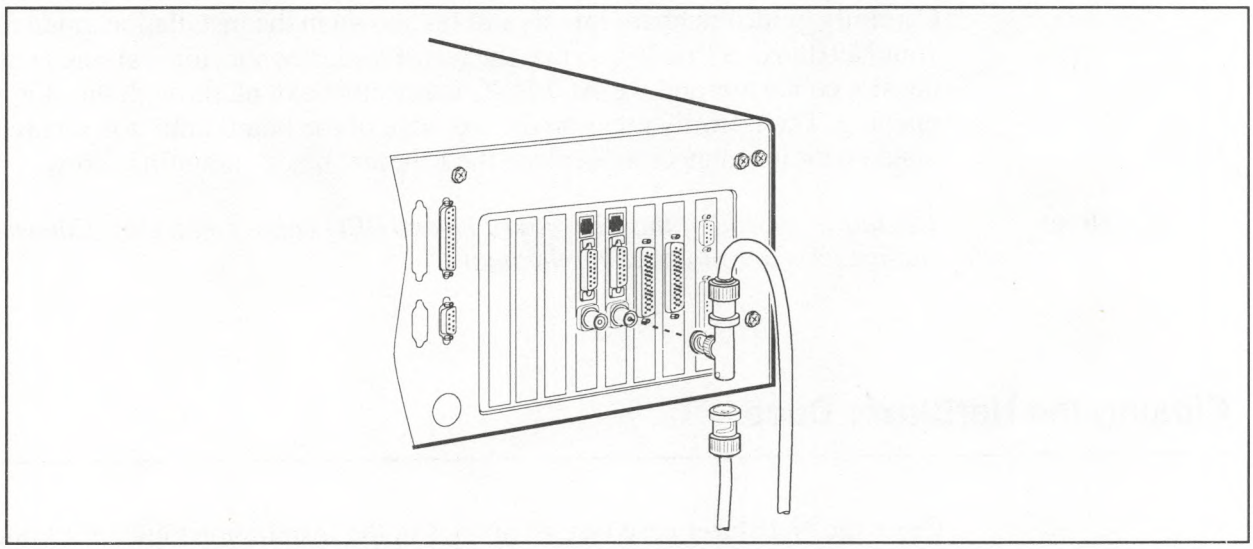


Figure 1-2. Thin Ethernet Connection

Connecting to a Thick Ethernet (10Base-5) Drop

To connect an AUI drop cable between the NetBlazer's Ethernet board and an external transceiver, perform the following steps.

1. Follow the instructions provided with your external transceiver to attach the transceiver to the network and attach the female end of the AUI drop cable to the transceiver.
2. Plug the male end of the drop cable into the AUI connector shown in Figure 1-3.
3. Push the sliding latch mechanism on the AUI connector down to secure the connector. The sliding latch is snug and may require some effort to lock in place.

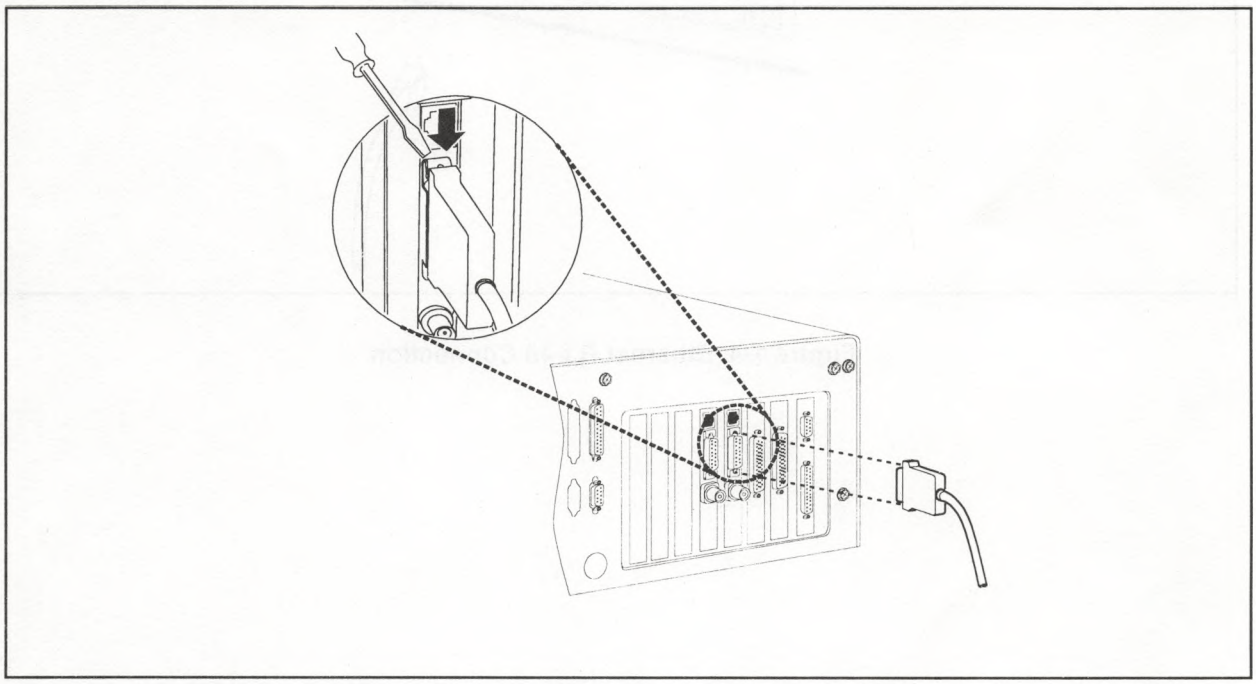


Figure 1-3. Ethernet AUI Connection

Connecting to an RJ-45 Twisted Pair (10Base-T)

Plug the RJ-45 cable connector into the female RJ-45 on the Ethernet board as shown in Figure1-4.

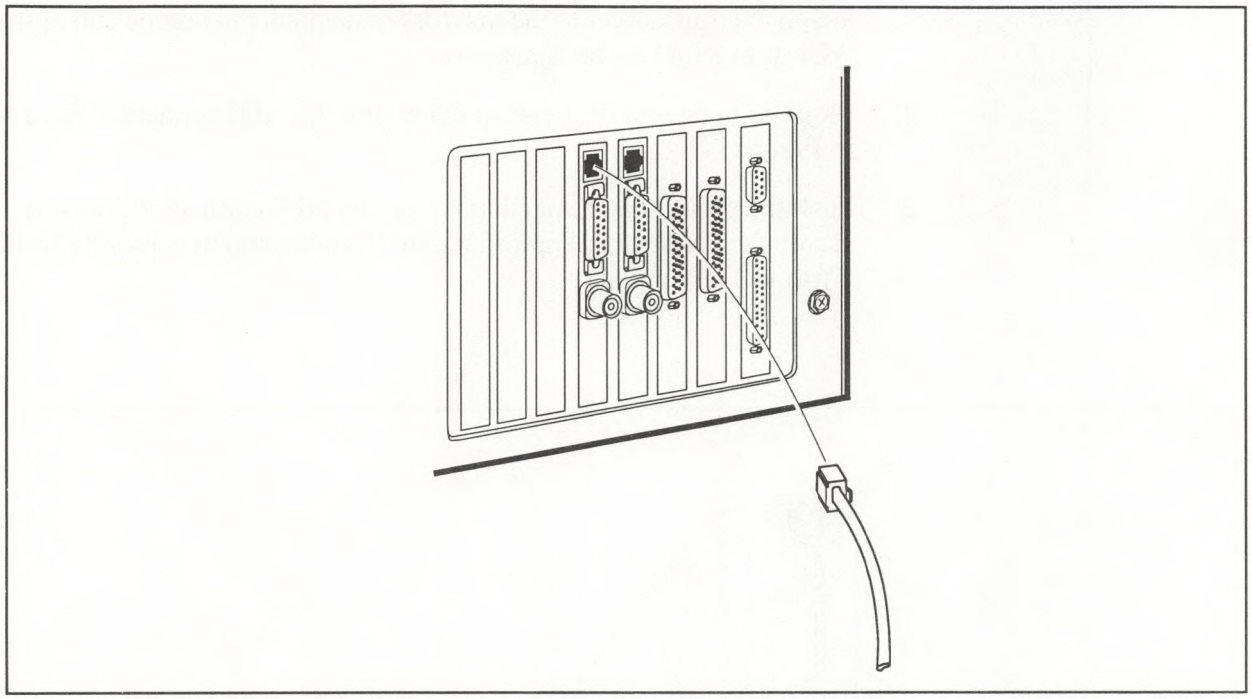


Figure 1-4. Ethernet RJ-45 Connection

Synchronous Board Installation 3

This document provides instructions for installing both the Telebit single-port and dual-port synchronous interface boards in a NetBlazer chassis. This procedure involves two basic operations: setting the base I/O address and configuring the board for the desired interface.

Factory Default Settings

As shipped from the factory, a synchronous board is preset to the following configuration:

- **NS-1 single-port board:** I/O Base 283h (syn0), V.35 interface. Only one single-port board is supported in a NetBlazer.
- **SYN*xxx* dual-port board:** syn10/syn11 (switches set to F0h). The interface daughter board types (RS-449, RS-530, V.35, X.21, and RS-232) are specified at time of initial order and are supplied with mating cables. Up to five dual-port synchronous boards can be installed in a NetBlazer 40 and up to two in a NetBlazer ST.

If your specific requirements involve a configuration other than the factory default settings identified above, or if you are installing more than one synchronous board, it is necessary to change the setting on switch SW2 on the SYN*xxx* dual-port synchronous board.

Perform the following procedures that are applicable.

Opening the NetBlazer Case

Warning: *Make sure that the NetBlazer is not connected to an AC power outlet; then open the NetBlazer case by performing the following steps:*

1. Using a Phillips screwdriver, remove the screws on the rear or side of the NetBlazer top cover, as shown in Figure 3-1 of the installation guide for the NetBlazer ST or 40.
2. Slide the top cover back and lift it off the NetBlazer.

This board is assigned to I/O base address 283h. Because the NetBlazer can only support one board of this type, this address cannot be changed. No further configuration is necessary unless you need to change the interface type from V.35 to RS-232 or RS-422/RS-449. This change is accomplished by moving a series of header plugs containing jumpers into different sockets. Figure 3-1 shows the factory default configuration of this board.

Caution: *The synchronous board is sensitive to static electricity. Observe ESD handling precautions and discharge any static on your body by touching an unpainted surface on the NetBlazer's frame before inserting the board into the NetBlazer.*

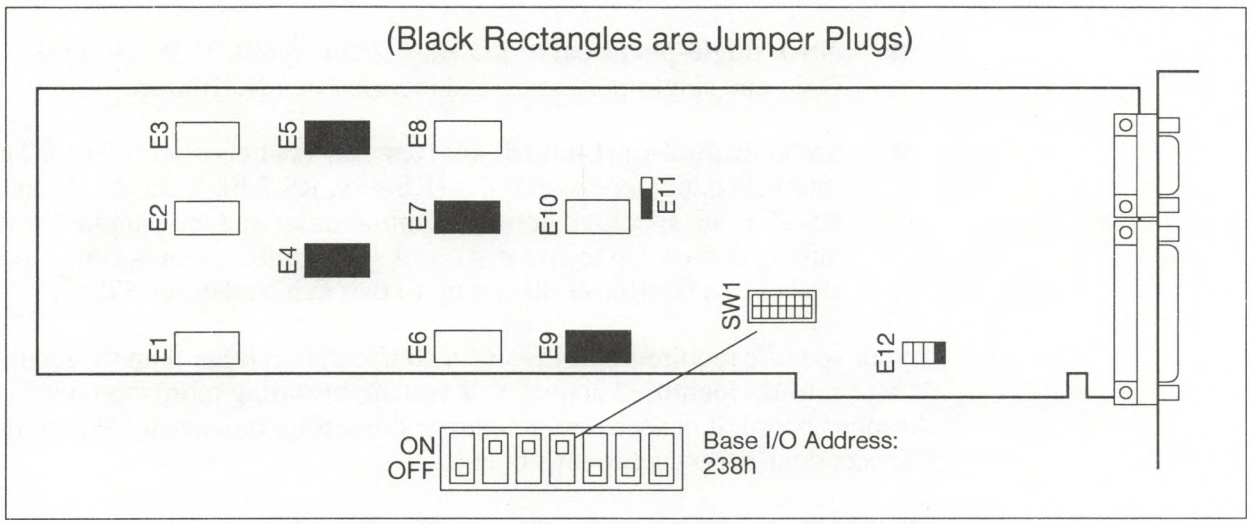


Figure 3-1. Single-Port Synchronous Board V.35 Configuration (Default)

V.35

The single-port synchronous interface board (along with a companion cable) is shipped from the factory configured to connect to a data service unit/channel switching unit (DSU/CSU) using a V.35 interface. If this matches your requirements, skip ahead to the next option.

RS-232 or RS-422/RS-449

If you have a DSU/CSU that uses an RS-232 or RS-422/RS-449 interface, you must obtain the appropriate cable and reconfigure the synchronous interface board by moving the four jumper plugs. If you are connecting to an ISDN TA (terminal adapter), contact Telebit Technical Support (1-408-734-5200) for a current list of compatible TAs.

Referring to Figure 3-2 for an RS-232 interface or Figure 3-3 for an RS-422/RS-449 interface, perform the following steps to configure the single-port synchronous interface board for an RS-232 or RS-422/RS-449 interface.

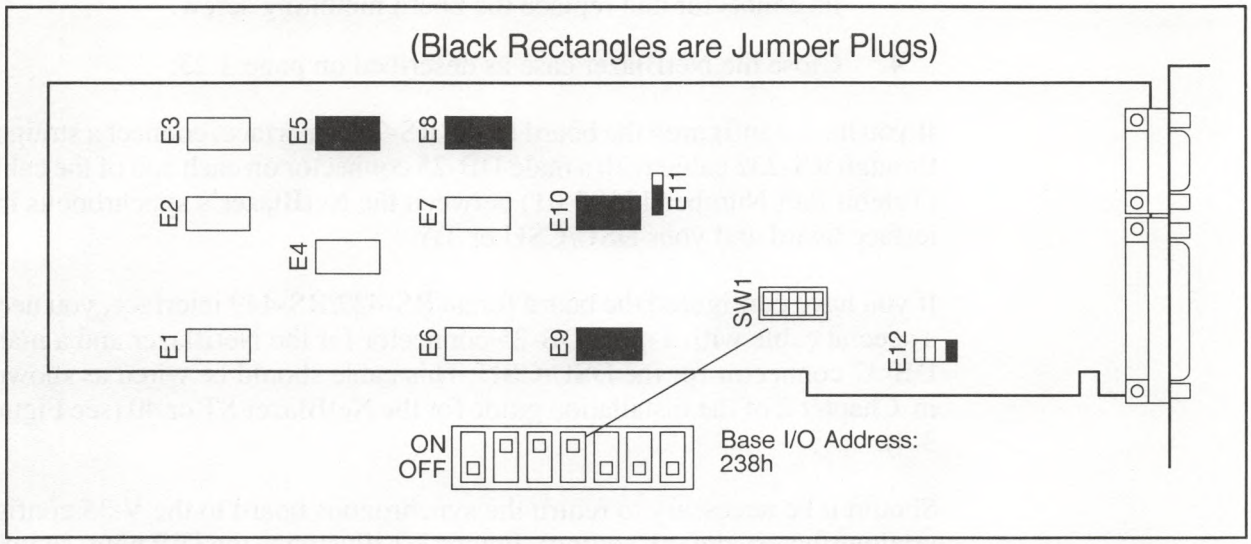


Figure 3-2. Single-Port Synchronous Board RS-232 Interface Configuration

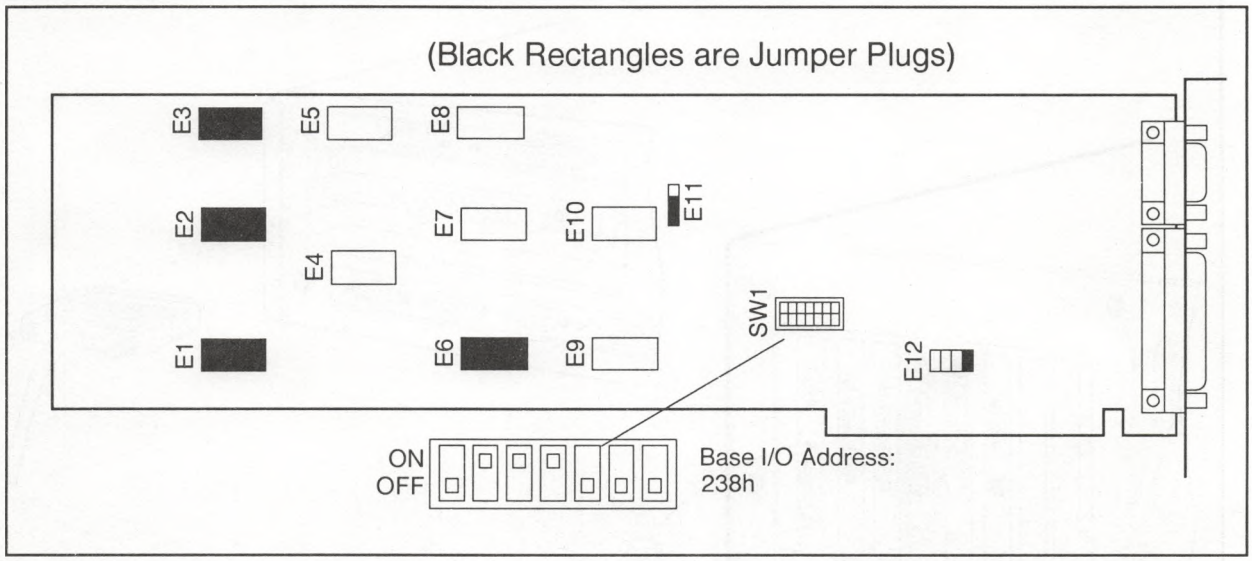


Figure 3-3. Single-Port Synchronous Board RS-422/449 Interface Configuration

1. Using a small flat-blade screwdriver or similar object, gently pry one end of the header plug up from its socket as illustrated by the highlighted (black) rectangles in the figures above. Repeat this at the other end of the header plug until the plug can be pulled straight out of the socket.

2. Verify that none of the pins on the plug has been bent, and place the plug over its new socket location.

3. Carefully guide the synchronous interface board into its slot so that the board's edge connector is aligned with the slot connector and the cable connectors extend through the slot opening. Make sure that all the pins on the plug are properly aligned with the socket, then firmly press on the top edge of the board so that it is securely mated with its connector and replace the board mounting screw.

4. Close the NetBlazer case as described on page 3-23.

If you have configured the board for an RS-232 interface, connect a straight-through RS-232 cable with a male DB-25 connector on each end of the cable (Telebit Part Number 12105-01) between the NetBlazer's synchronous interface board and your DSU/CSU or TA.

If you have configured the board for an RS-422/RS-449 interface, you need a special cable with a male DB-25 connector for the NetBlazer and a male DB-37 connector for the DSU/CSU. This cable should be wired as shown in Chapter 2 of the installation guide for the NetBlazer ST or 40 (see Figure 3-4).

Should it be necessary to return the synchronous board to the V.35 configuration (factory default setting), Figure 3-1 illustrates the DIP plug, switch, and jumper positions.

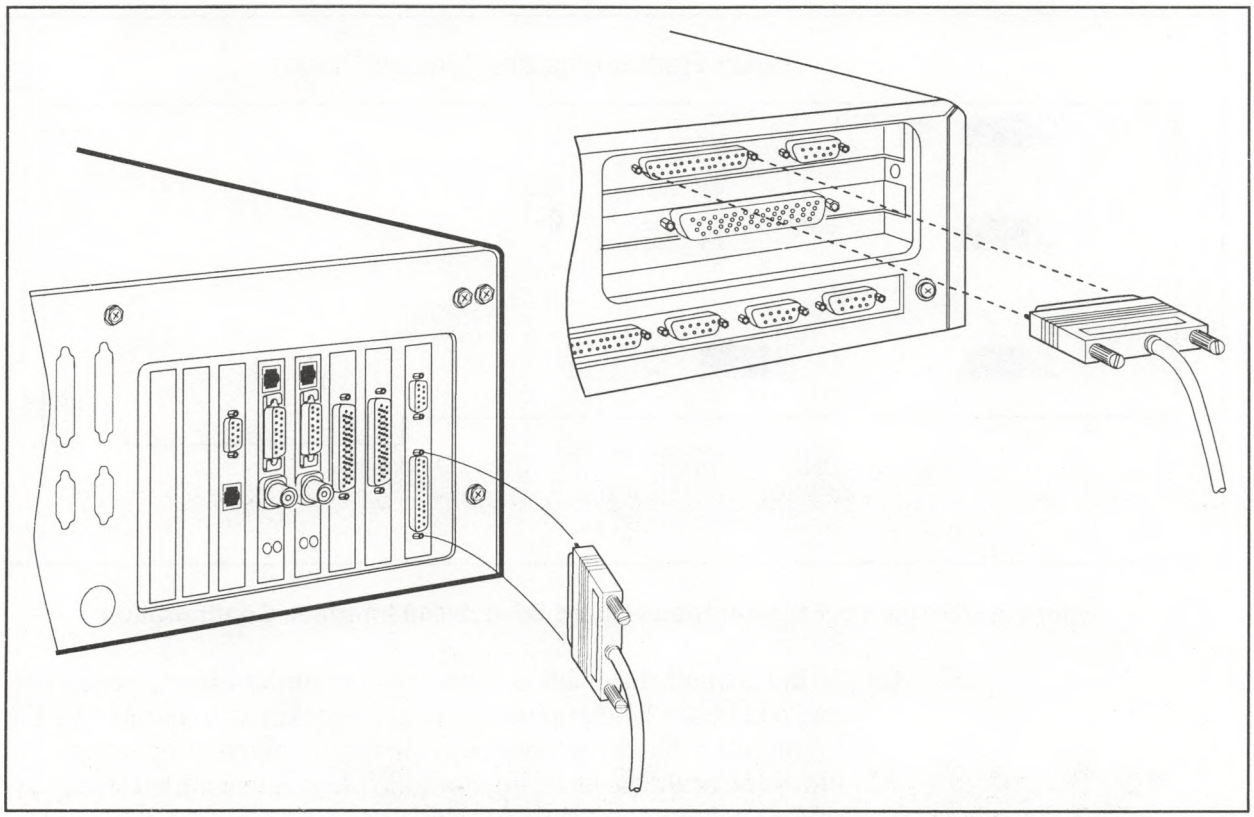


Figure 3-4. Connecting to the Single-Port Synchronous Board

Configuring the Dual-Port Synchronous Board (SYN*xxx*)

The SYN*xxx* dual-port boards are assigned in the following group pairs:

- syn10 and syn11
- syn20 and syn21
- syn30 and syn31
- syn40 and syn41
- syn50 and syn51

Up to five SYN*xxx* dual-port synchronous boards can be installed in a NetBlazer. The *xxx* portion of the model number defines the interface type (that is, SYN530 is a dual-port synchronous board with an RS-530 interface). The interface types (RS-449, RS-530, V.35, X.21, and RS-232) are specified at time of initial order and are supplied with mating cables.

Notes:

1. *Interface daughter boards must be of the same type and cannot be mixed on a dual-port synchronous board.*
2. *Interface cables are shipped with their respective daughter boards and are prewired for the interface type. Warning labels are provided on the daughter boards and interface cables clearly identifying their types.*
3. *RS-449 cables, RS-530 cables, and X.21 cables use the same daughter board.*
4. *The use of Port A is recommended for a high speed (T1 or E1) link. Port B is limited to 128-Kbps operation.*

Warning: *Be certain that the correct cable type is used with the corresponding daughter board. Plugging these cables into daughter boards of a different interface type can result in damage to the daughter board and/or connecting equipment.*

Table 3-1 summarizes the dual-port synchronous board models, their respective daughter board interface types, and mating cables.

Table 3-1. Interface Types

Dual-Port Synchronous Board Model	Interface Type	Cable
SYN449	RS-449	12720-01
SYN530	RS-530	13203-01
SYN35	V.35	12722-01
SYN232	RS-232	12721-01
SYNX21	X.21	14257-01

Caution: *The main synchronous board and the daughter boards are sensitive to static electricity. Observe ESD handling precautions and discharge any static on your body by touching an unpainted surface of the NetBlazer's frame before inserting these boards into the NetBlazer.*

Note: *Only the V.35 interface daughter board contains a jumper. Be sure it is positioned on the two upper pins as shown in Figure 3-5.*

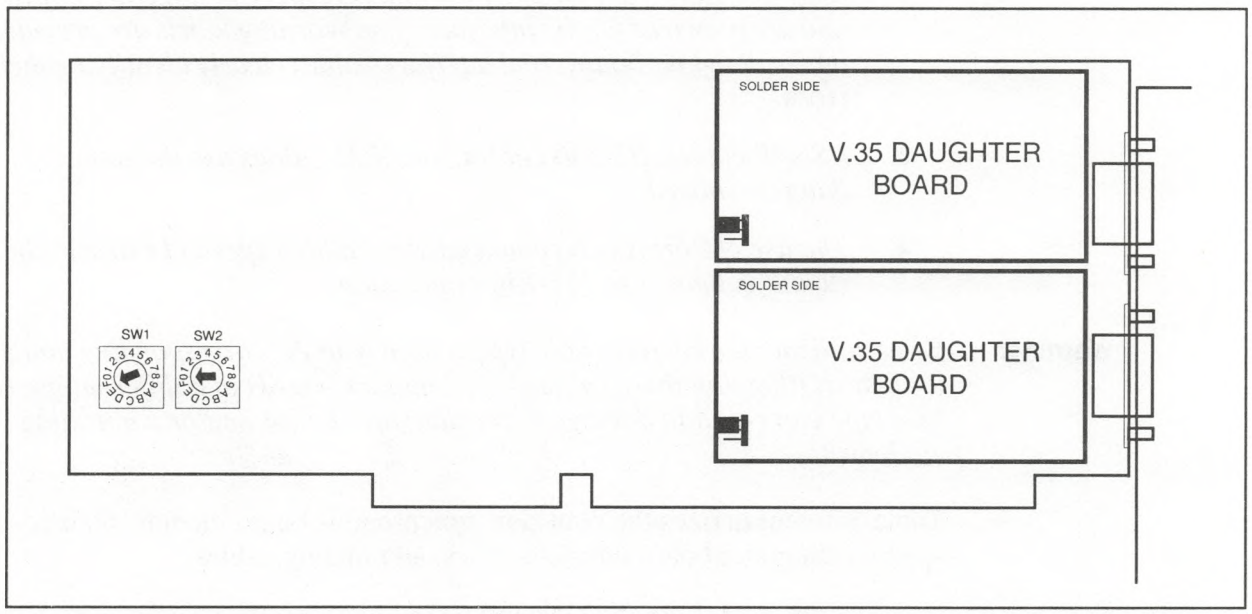


Figure 3-5. V.35 Daughter Board Jumper Position

Setting Switches on the Dual-Port Synchronous Board

As shipped from the factory, the SYN*xxx* dual-port synchronous boards are preset to syn10 and syn11 (switches set to F0h). If you are adding more than one synchronous board to your NetBlazer, determine the required setting of SW2 on the main board (see Figure 3-5).

Table 3-2. Synchronous Board Base I/O Address Assignments

Synchronous Board	Switch Setting (SW2)
syn0*	Reserved for single-port synchronous board
syn10, syn11	F0
syn20, syn21	F2
syn30, syn31	F4
syn40, syn41	F6
syn50, syn51	F8

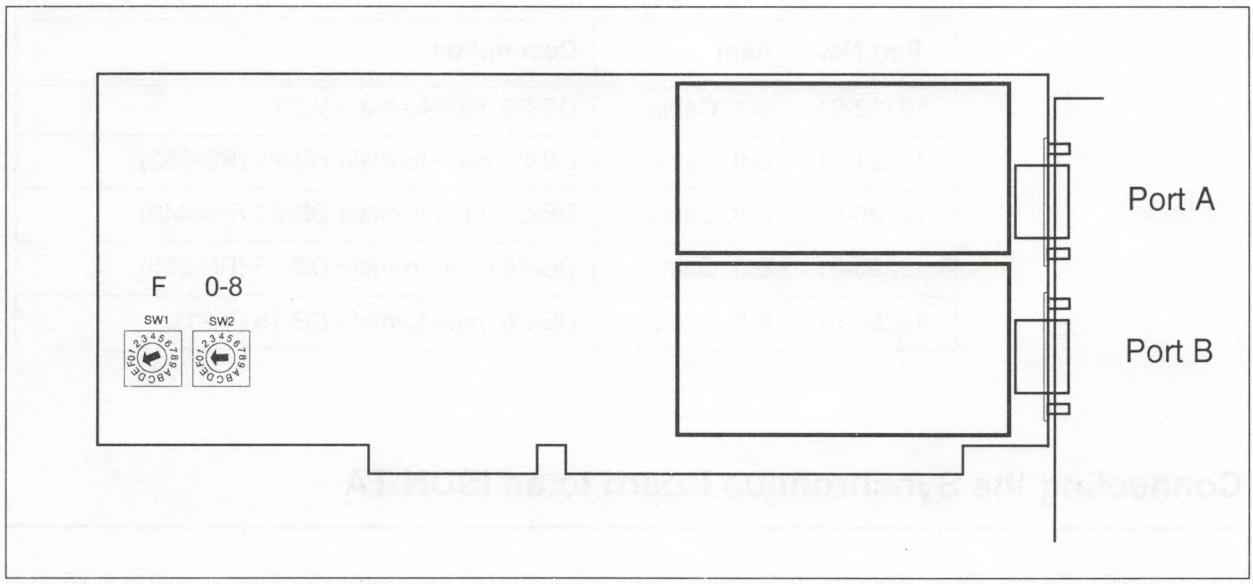


Figure 3-6. Dual-Port Synchronous Board Address Switch Location

Closing the NetBlazer Case

1. Close the NetBlazer case as described in Chapter 3 of the installation guide for the NetBlazer ST or 40.
2. Apply the appropriate stick-on labels (supplied with the NetBlazer) to the synchronous ports.
3. Connect the AC power cord supplied with your NetBlazer between the power cord connector on the back of the NetBlazer and an AC outlet.

Connecting the Synchronous Board to a DSU/CSU

Connect the synchronous board to DSU/CSU using the appropriate cable. Secure the cable end connectors to the board with the captive thumb screws.

Note: *The use of Port A is recommended for a high speed (T1 or E1) link.*

Table 3-3 provides additional detail about the Telebit cables available for the various interface types.

Table 3-3. Synchronous Cables

Part No.	Item	Description
12722-01	6-ft. Cable	DB-26 male-to-male V.35.
12721-01	6-ft. Cable	DB-26 male-to-male DB-25 (RS-232).
12720-03	6-ft. Cable	DB-26 male-to-male DB-37 (RS-449).
13203-01	6-ft. Cable	DB-26 male-to-male DB-25 (RS-530).
14257-01	6-ft. Cable	DB-26 male-to-male DB-15 (X.21).

Connecting the Synchronous Board to an ISDN TA

If you are connecting to an ISDN TA, contact Telebit Technical Support (1-408-734-5200) for a current list of compatible TAs.

Connect the synchronous board cable between the NetBlazer's synchronous port and the ISDN TA. Refer to the instructions provided with your TA as required.

Other Ethernet Board Configurations C

The following information is furnished to provide continuity in documentation of previous versions of Telebit Ethernet boards. Note that these boards have been superseded by the NE1 Ethernet board described in Chapter 1.

First-Generation Ethernet Board (WD8013)

This Ethernet board provides both thin Ethernet (BNC) and thick Ethernet (AUI) connections to a local area network. The board is preset at the factory for connection to thin Ethernet media. If you plan to use the AUI media type, you must change the W3 jumper to activate this connector as shown in Figure C-1.

Caution: *The Ethernet board is sensitive to static electricity. Observe ESD handling precautions and discharge any static on your body by touching an unpainted surface of the NetBlazer's frame before inserting the board.*

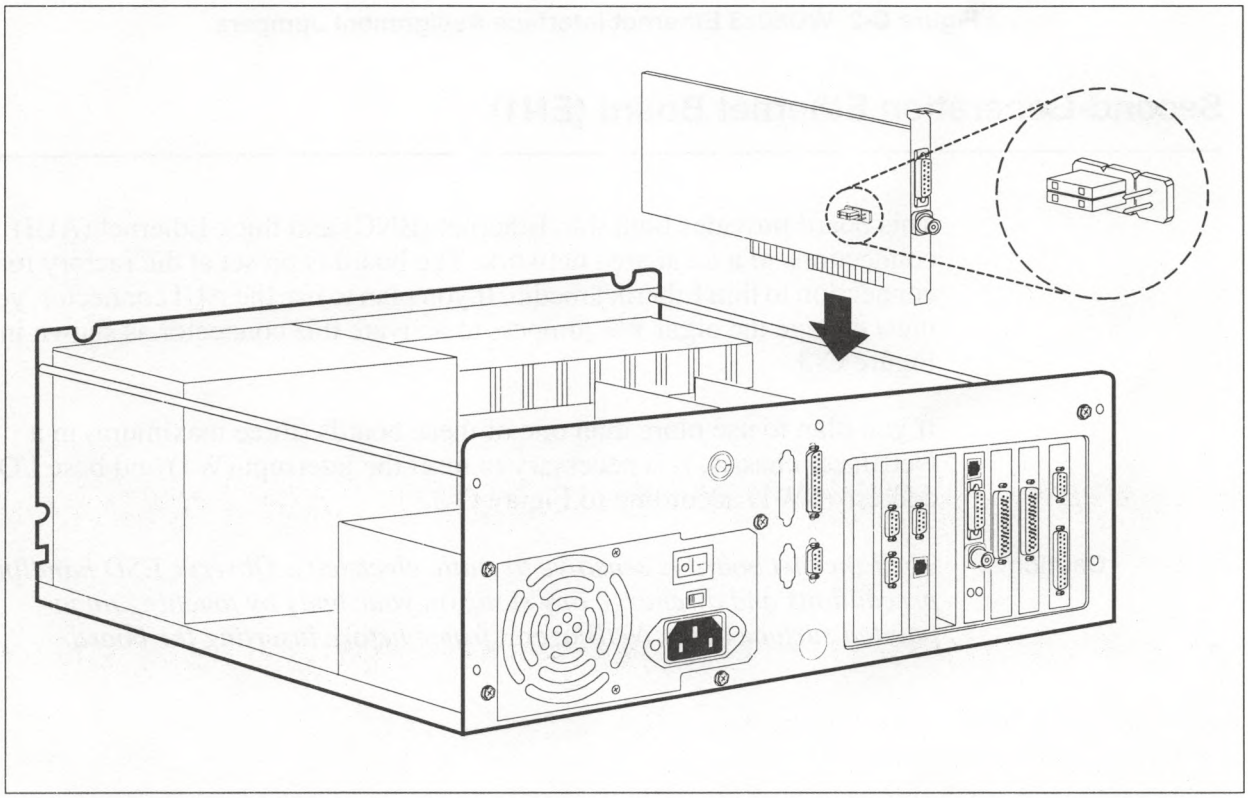
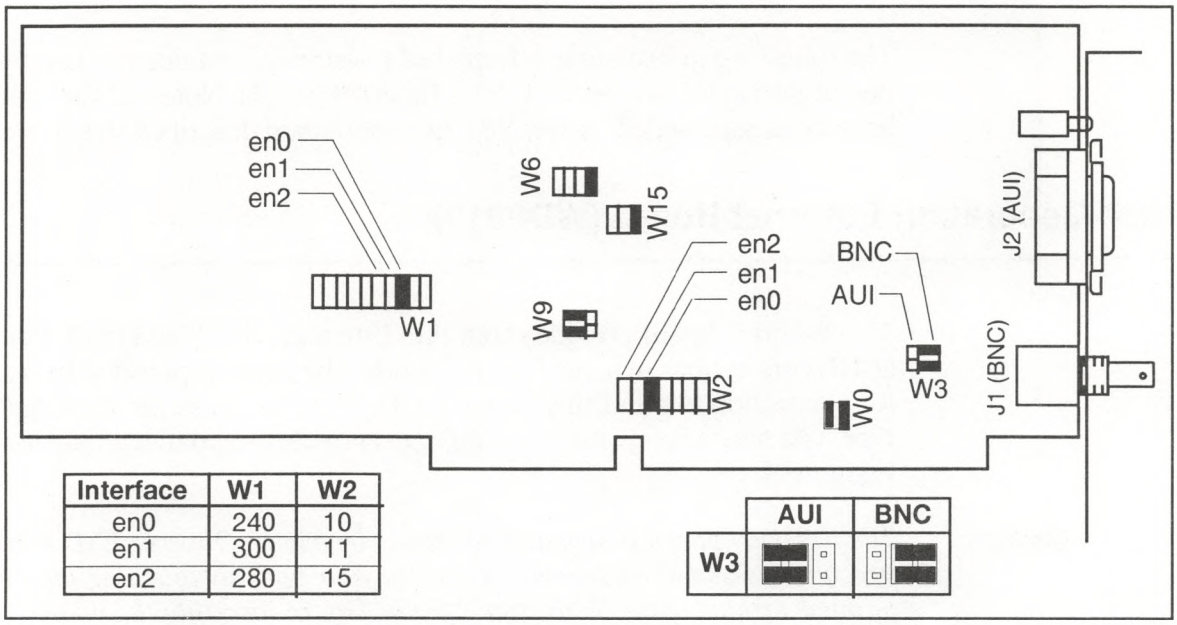


Figure C-1. First-Generation Ethernet Board Media Type Jumper Locations

Ethernet board interface assignment (en0, en1, and en2) jumpers are illustrated in Figure C-2.



Interface	W1	W2
en0	240	10
en1	300	11
en2	280	15

Figure C-2. WD8013 Ethernet Interface Assignment Jumpers

Second-Generation Ethernet Board (EN1)

This board provides both thin Ethernet (BNC) and thick Ethernet (AUI) connections to a local area network. The board is preset at the factory for connection to thin Ethernet media. If you plan to use the AUI connector, you must change the eight W2 jumpers to activate this connector as shown in Figure C-3.

If you plan to use more than one of these boards (three maximum) in a NetBlazer chassis, it is necessary to reset the interrupt (W1) and base I/O address (SW1) according to Figure C-3.

Caution: *The Ethernet board is sensitive to static electricity. Observe ESD handling precautions and discharge any static on your body by touching an unpainted surface of the NetBlazer's frame before inserting the board.*

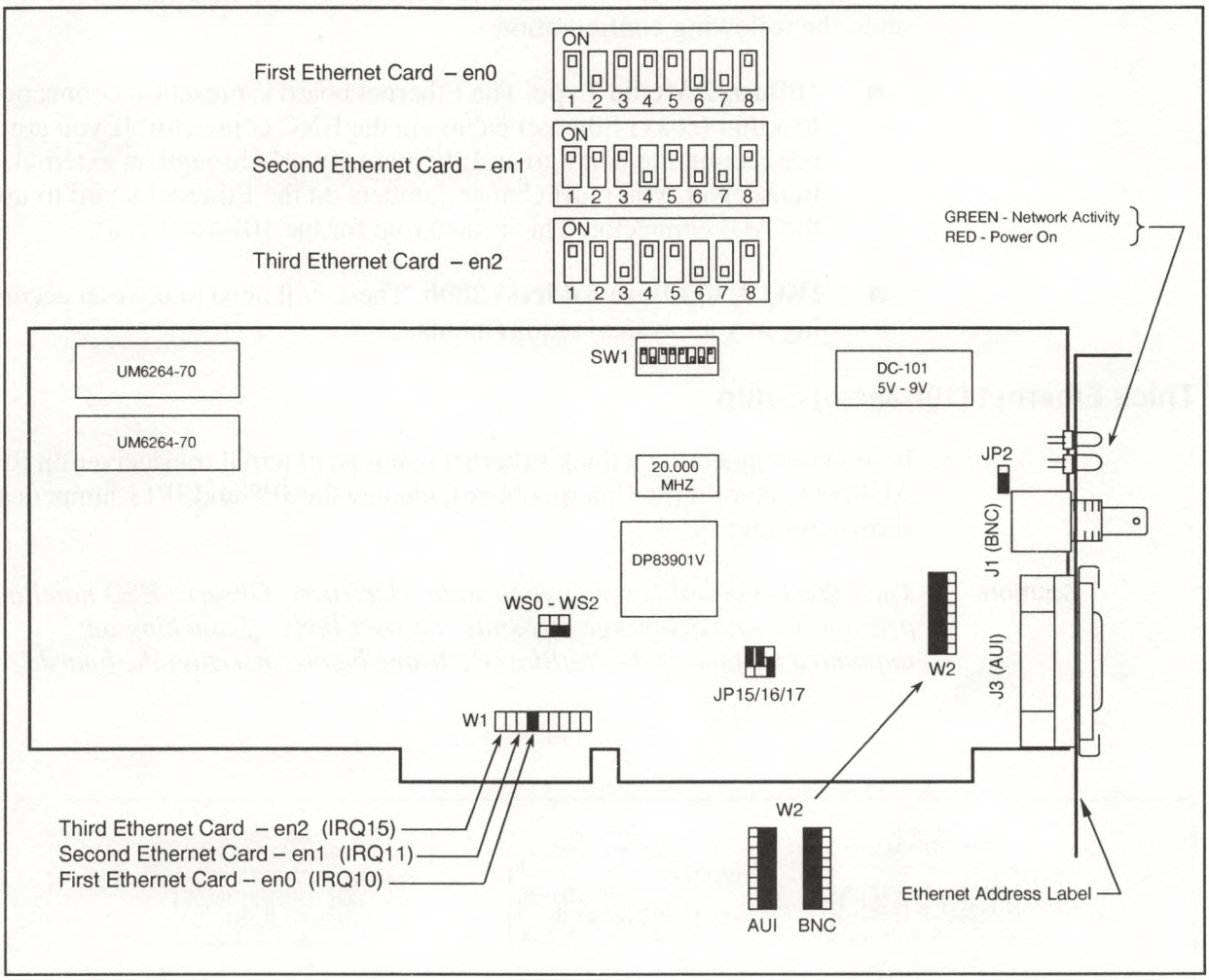


Figure C-3. Second-Generation Ethernet Board Jumper Locations

Third-Generation Ethernet Board (NE1)

This board provides an RJ-45 twisted-pair port (for 10Base-T) in addition to the thin Ethernet (BNC connector) and the AUI port.

Note: *If you plan to boot the NetBlazer remotely from a bootp server, the NetBlazer's en0 interface must be on the same Ethernet segment as the bootp server or on the same Ethernet segment as another NetBlazer with the bootp forwarding function enabled. In the latter case, the second NetBlazer is used to forward bootp requests to the network bootp server. Refer to the Network Management section of the* NetBlazer Configuration Guide *for details.*

Factory Default Option Settings

As shipped from the factory, the third-generation NE1 Ethernet board is preset to the following configuration:

- **10Base-2 Media Type.** The Ethernet board is preset for connection to a thin (coax) Ethernet cable via the BNC connector. If you are connecting the board to an Ethernet network through an external transceiver, you must change jumpers on the Ethernet board to use the AUI connector. This is also true for the 10Base-T port.
- **IRQ 3, I/O Base Address 280h.** These will need to be reset according to your system requirements.

Thick Ethernet (10Base-5) Setup

If you are connecting a thick Ethernet using an external transceiver on the AUI connector on the Ethernet board, change the JP8 and JP11 jumpers as shown in Figure C-4.

Caution: *The Ethernet board is sensitive to static electricity. Observe ESD handling precautions and discharge any static on your body by touching an unpainted surface of the NetBlazer's frame before inserting the board.*

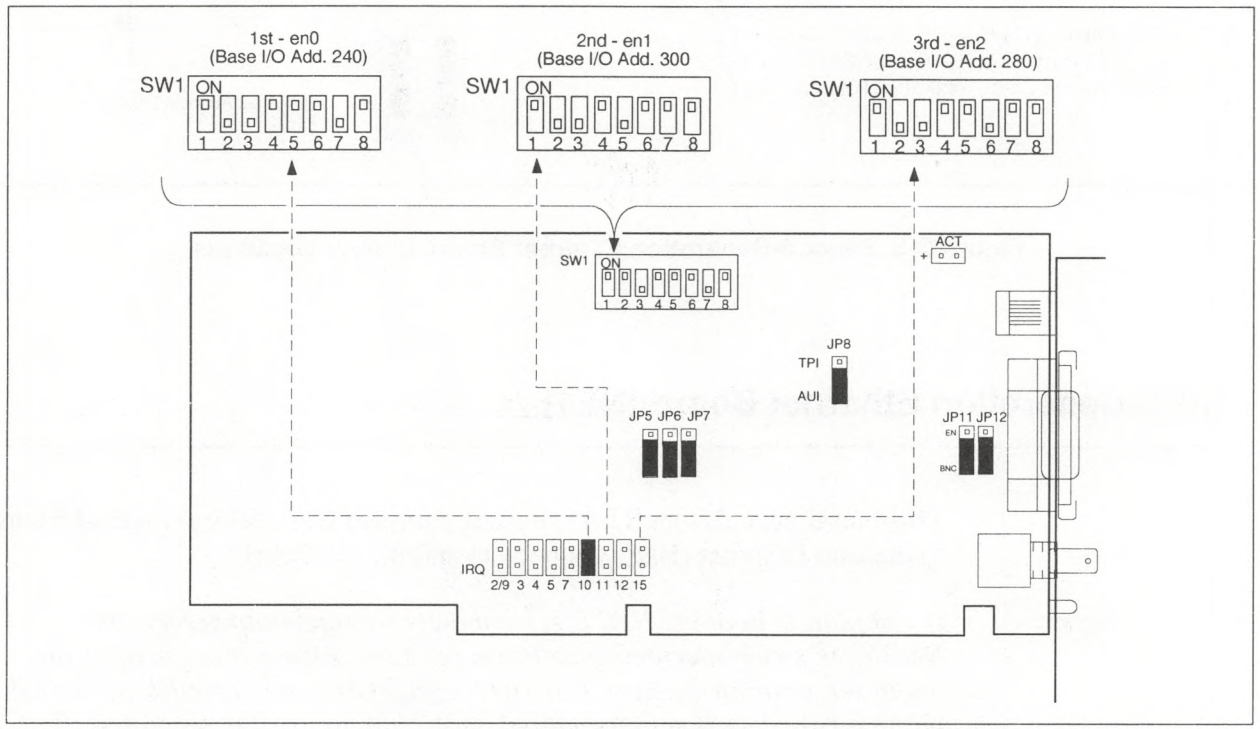


Figure C-4. Ethernet Board Jumpers (AUI, en0)

RJ-45 Setup (10Base-T)

To configure the Ethernet board to use the RJ-45 port, first remove the board (if applicable). Then, perform the following steps:

1. Move the jumper plug on JP11 on the bottom two pins (BNC disabled).
2. Move the jumper plug on JP8 to connect the top two pins.

Table C-1 summarizes the media type selection jumpers.

Table C-1. Ethernet Media Selection Jumpers

Media Type	JP8	JP11
Thin (BNC) *Default*		
Thick (AUI) (10Base5)		
RJ-45 (10BaseT)		

IRQ and Base I/O Address

Both the Ethernet and Token Ring boards share the same set of interrupts. When configuring a NetBlazer containing multiple Ethernet boards or mixed Ethernet and Token Ring boards, it is very important that the appropriate IRQs and base I/O addresses be set correctly.

The IRQ jumper bank on the lower edge of the board assigns the IRQ level, while switch SW1 assigns the corresponding base I/O address. Refer to Figure C-4 and Table C-2 for the setting appropriate for your installation.

Table C-2. Ethernet IRQ Level and Base I/O Address Assignments

Ethernet Board	IRQ	Base Address (SW1)
en0	10	240h
en1	11	300h
en2	15	280h